

## **EXECUTIVE SUMMARY**

This limiting habitat factors analysis is conducted pursuant to Chapter 75.46 RCW (Salmon Recovery); its purpose is "to identify the limiting factors for salmonids", where "limiting factors" are defined as "conditions that limit the ability of habitat to fully sustain populations of salmon." The findings of this analysis are to be used by a locally-based habitat project selection committee to prioritize appropriate projects for funding under the state salmon recovery program, as well as assist potential project sponsors in identifying projects.

This initial version of the analysis is limited in its consideration to anadromous fish in **Water Resource Inventory Area (WRIA) 31**. As part of the adaptive management process defined in 75.46 RCW, this document will be revised as necessary when more information becomes available.

## **WATERSHED CONDITION**

WRIA 31 (Rock-Glade) encompasses an area of 1650 square miles and consists of numerous small watersheds draining into the Columbia River between John Day Lock and Dam and the mouth of the Yakima River. The geology of the WRIA is dominated by extensive basalt flows having a total thickness of up to 5000 feet. The erosion-resistant nature of these flows has resulted in the creation of deep (500 to 800 feet), steep-walled canyons and has severely constrained floodplain development along substantial portions of the streams within this WRIA.

The streams in this WRIA appear to have similar geomorphic characteristics. Head-water tributaries flow out of the mountains and across the relatively flat basalt plateau at gradients of generally less than one percent; this area is above known anadromous use. Coming off the plateau, streams enter steep-walled canyons; gradients increase to 2 – 4% or more; fish habitat quality is generally fair to poor, with little suitable spawning and rearing habitat. Below the canyon reaches, streams enter alluvial valleys; gradients range between 1% and 2% near the upper end, diminishing to less than 1% as streams approach the Columbia. Fish habitat in these sections is highly variable, ranging from poor to excellent.

Extensive flatlands which existed along the Columbia prior to inundation have formed shallow wetlands and embayments along the shore of Lake Umatilla. These serve as holding or resting areas for migrating adults and juveniles.

Climate over the entire WRIA is typical of that found on the east side of the Cascades; average daily temperatures range from 70°F in the summer (with maximums commonly above 90 °F) and 37°F in the winter. Annual precipitation ranges from 20 to 25 inches in the headwaters of Rock Creek to less than 10 inches over most of the eastern half of the WRIA.

The WRIA is divided between Benton (50%), Klickitat (44%) and Yakima (6%) counties. Over 90% of land base is privately owned. Almost 50% of the land is in agricultural use (primarily wheat and other dryland crops), while 37% is in non-forested range. Less than 10% of the WRIA is forested, primarily in the headwaters of Rock Creek and Pine Creek; much of the forested land also has active grazing allotments. Urban development occupies less than one percent of the WRIA and is limited to the city of Kennewick (pop. 49,000) and a number of small, unincorporated towns.

### **Distribution and Condition of Stocks**

Three species of anadromous salmon utilize the streams in WRIA 31:

**Fall chinook** found in this WRIA are stray upriver brights belonging to either the wild Hanford Reach stock, or the Bonneville Pool Hatchery stock. Known utilization is limited to the lower portions of Rock Creek and Chapman Creek, and along the shore of Lake Umatilla.

**Coho** found in this WRIA are believed to be stray hatchery fish; there may also be a minor amount of natural production. Some utilization by juveniles has been noted in the lower portion of Chapman Creek and along the shore of Lake Umatilla; potential coho habitat has been identified in the lower portion of Glade Creek.

Rock Creek **summer steelhead** are the only fish indigenous to the WRIA; this stock belongs to the Mid-Columbia Evolutionarily Significant Unit (ESU) for steelhead, which has been listed as “threatened” under the Endangered Species Act. Known utilization includes the lower and middle portions of Rock Creek, lower Quartz Creek, Squaw Creek, lower Chapman Creek, lower Wood Gulch and Bighorn Canyon. Potential spawning and rearing habitat has been identified in Pine Creek and Alder Creek.

### **Limiting Habitat Factors**

#### **Access**

- *Barrier culverts at SR 14 on Pine Creek preclude access to potential steelhead habitat.*
- *Low or non-existent flows in all streams during the late summer, fall, and early winter will limit or preclude utilization by fall spawning adults (chinook, coho), and limit mobility of juveniles of all species.*
- *High stream temperatures in the lower portions of all streams during the summer and early fall will limit mobility of juveniles of all salmonid species.*

## **Floodplains/Wetlands/Riparian Areas**

- *Grazing and trampling by cattle in and near stream banks has caused accelerated channel incision (entrenchment, downcutting) and resulted in a reduction in the quality and amount of available existing or potential fish habitat; continued grazing activity in these areas may delay recovery where functional floodplains and riparian areas are becoming reestablished.*
- *Channel widening and obliteration of riparian zones caused by a 75 to 100 year flood event in 1996 has resulted in locally poor habitat quality and riparian condition. While there may be long term benefits (LWD recruitment, creation of complex habitat) as a result of this event, there may be opportunity to accelerate habitat recovery and improve stability against smaller, more frequent floods through channel and riparian restoration activities.*
- *Cattle watering at, or in the vicinity of, spring areas may have adverse impacts on water quality. Spring outflow into fish-bearing waters may provide important cool water refuges for juvenile salmonids during the summer and early fall.*
- *Functional quality of riparian areas has been adversely impacted by grazing and forest practices in many locations throughout the watershed. Types of impacts include removal of or damage to riparian vegetation and compaction and erosion of stream banks and adjacent floodplain areas.*

## **Water Quantity and Quality**

- *Low or non-existent flows in all streams during the late summer, fall, and early winter will limit or preclude utilization by fall spawning adults (chinook, coho), limit mobility of juveniles of all species, and may result in mortality due to stranding.*
- *High stream temperatures in the lower portions of all streams during the summer and early fall will limit mobility of juveniles of all salmonid species, and may result in mortality due to thermal stress.*

## **Information Gaps**

The limiting factors described above were identified based upon a very limited amount of information that was available for this WRIA. More detailed information should be collected to more precisely define these factors, and to identify specific areas where restoration activities will best redress them. The information to be collected includes the following:

- *Further investigation of fish utilization and habitat availability and quality, to be conducted on all accessible or potentially accessible streams.*
- *Further investigation of potential barriers should be conducted on all fish bearing streams, using an approved assessment and inventory protocol.*
- *More detailed evaluations of the condition of channels, floodplains, wetlands, and riparian areas.*
- *Identification of sediment sources, sinks, and sediment related impacts to habitat.*
- *A stream temperature study to provide a better understanding of the causative factors of high stream temperatures.*

A watershed assessment, funded by the Columbia River Basin Fish and Wildlife Authority and administered by the Yakama Nation, will be initiated in the next year. It is anticipated that most, if not all, of the information needs described above will be accounted for as part of this assessment.